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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/783,806

02/20/2004

Jin Cao

Cao 2-2-6

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LAW OFFICE OF JOHN LIGON  
213 E. HIGHLAND AVENUE  
P.O. BOX 281  
ATLANTIC HIGHLANDS, NJ 07716

EXAMINER

OSBORNE, LUKE R

ART UNIT

PAPER NUMBER

2123

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/783,806	<b>Applicant(s)</b> CAO ET AL.	
	<b>Examiner</b> LUKE OSBORNE	<b>Art Unit</b> 2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 20 February 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 13-18 is/are rejected.
- 7) ☒ Claim(s) 7-12 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Claim Status***

1. Claims 1-18 are pending in the instant application.  
Claims 1-6, 13-18 are rejected.  
Claims 7-12 are objected to.

### ***Incorporation by Reference***

2. The attempt to incorporate subject matter into this application by reference to the article, entitled "A Statistical Model For Allocating Bandwidth To Best-Effort Internet Traffic," 2004 [In Preparation] on page 3 of Applicant's specification is ineffective because the referenced documents are not clearly identified as required by 37 CFR 1.57(b)(2)).

The incorporation by reference will not be effective until correction is made to comply with 37 CFR 1.57(b), (c), or (d). If the incorporated material is relied upon to meet any outstanding objection, rejection, or other requirement imposed by the Office, the correction must be made within any time period set by the Office for responding to the objection, rejection, or other requirement for the incorporation to be effective. Compliance will not be held in abeyance with respect to responding to the objection, rejection, or other requirement for the incorporation to be effective. In no case may the correction be made later than the close of prosecution as defined in 37 CFR 1.114(b), or abandonment of the application, whichever occurs earlier.

Any correction inserting material by amendment that was previously incorporated by reference must be accompanied by a statement that the material being inserted is the material incorporated by reference and the amendment contains no new matter. 37 CFR 1.57(f).

### ***Claim Objections***

3. Claims 13 and 17 are objected to because of the following informalities: Claims 13 and 17 contain the acronym QoS. These acronyms should be expanded with their first use in every independent limitation for clarity. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 13 -18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 13 and 17 provides for the use of the mathematical model as specified, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claims 13-18 are rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

Any claim not directly rejected on 35 U.S.C 112, 2<sup>nd</sup> stands rejected due to its dependency.

The art rejections of the claim(s) listed above are applied as best understood in light of the rejection under 112, 2<sup>nd</sup> paragraph discussed above.

### ***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 13 -18 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 13 and 17 are rejected as being directed to an abstract idea, being a mathematical model. While claim 13 and 17 are directed to a method, the claim is only directed to the mathematical formula set forth to represent a model. The claimed methods are only directed to a model. With only the model present in the claims they consist solely of mathematical operations without some claimed practical application.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-3, 6 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5812526 to Chang et al., hereinafter “Chang”.

Regarding claim 1 Chang discloses a method for determining a bandwidth required for meeting one or more quality-of-service ("QoS") criterion on a transmission link [Chang: Source nodes may transmit cells at a fixed bandwidth or a variable bandwidth. Associated with the cells of each communication is a QoS requirement. Each node may have plural queues including one queue for each QoS requirement (Column 7, lines 52-65)] comprising the steps of:

generating a plurality of streams of traffic for the transmission link [Chang: Each queue 110, 120 is for storing cells received from incoming bitstreams for later transmission on one or more outgoing bitstreams (Column 11 line 45 - Column 12 line 6)];

conducting a plurality of simulations of bandwidth for the link, based on generated traffic streams and using systematically varying values of the one or more

QoS criterion [Chang: Illustratively, one queue is provided for each different type of QoS accommodated by the node. In FIG. 6, the QoS's are broadly grouped into delay sensitive (such as audio, video or interactive data bearing cells) and delay insensitive (such as transactional data bearing cells) (Column 11 line 45 – Column 12 line 6) In the fuzzy congestion controller 230, the two threshold model is used as a basis to derive the fuzzy logic rule base. Through simulation, the parameters of queue occupancy  $q$ , queue occupancy variance  $\Delta q$  and cell loss probability  $p_{sub.l}$  have been discovered to provide a good basis for determining the "congestiveness" of a specific queue 110 or 120 (FIG. 6) at the node 100 (FIG. 6) (Column 14, lines 6-18)];

developing a model addressed to a relationship between bandwidth and the one or more QoS criterion based on the simulations [Chang: Below, the fuzzy logic processing of the fuzzy bandwidth calculator 210, fuzzy admission controller 220 and fuzzy congestion controller 230 are discussed in greater detail (Column 14, lines 6-8)]; and

applying the developed model to determine bandwidth required to meet the one or more QoS criterion on a link [Chang: The operation of the fuzzy bandwidth calculator 210 (FIG. 7) (Column 16, lines 58-67)].

Regarding claim 2 Chang discloses the method of claim 1 wherein each of the generated traffic streams has a fixed traffic bit rate and the traffic bit rate varies from stream to stream

[Chang: Each of the nodes communicate with each other by transmitting a bitstream to one another via links, which bitstream is organized into fixed length timeslots. Communication is achieved according to the ATM protocol whereby the nodes selectively read fixed length cells

from, and write fixed length cells into, the fixed length timeslots of the bitstream. Source nodes may transmit cells at a fixed bandwidth (Column 7, lines 52-65)].

Regarding claim 3 Chang discloses the method of claim 1 wherein the streams of traffic are organized into packets and the traffic streams are defined by packet arrivals and sizes [Chang: Communication is achieved on the communication network 10 by transmitting a bitstream on the links. The bitstream is organized into fixed length time slots. Each node that desires to communicate writes fixed length packets called "cells" into the timeslots (Column 1, lines 37-47)].

Regarding claim 6. Chang discloses the method of claim 1 wherein the step of conducting plural simulations includes the sub-steps of: choosing a trial bandwidth for a given simulation; and iteratively repeating the simulation with an incremental change in the trial bandwidth until a QoS value realized for the simulation substantially matches a selected QoS criterion

[Chang: In the fuzzy congestion controller 230, the two threshold model is used as a basis to derive the fuzzy logic rule base. Through simulation, the parameters of queue occupancy  $q$ , queue occupancy variance  $\Delta q$  and cell loss probability  $p_{sub.l}$  have been discovered to provide a good basis for determining the "congestiveness" of a specific queue 110 or 120 (FIG. 6) at the node 100 (FIG. 6). In addition, the simulations reveal that the following term sets provide an optimal basis for determining traffic load adjustment:  $T(q)=[E, F]$ ,  $T(\Delta q)=[N, P]$ ,  $T(p_{sub.l})=[S, NS]$  and  $T(y)=[DS, NC, IS, IM]$  (Column 14, lines 6-18)].

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:



(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang in view of "Internet Traffic: Statistical Multiplexing Gains" by Cao et al., published 2/2002 hereinafter "Cao".

Regarding claim 4 Chang teaches the method of claim 1 wherein the traffic streams are generated [Chang: Each queue 110, 120 is for storing cells received from incoming bitstreams for later transmission on one or more outgoing bitstreams. (Column 11 line 45 – Column 12 line 6)].

Chang does not expressly teach that the generated bitstream is generated synthetically based on a statistical model.

Cao teaches generating the bitstream synthetically with a statistical model [Cao: We found that very simple statistical time series models, which we call fractional sum

difference (FSD) models and FSDMA(1) models, provide an excellent fit to the ... for the live and synthetic link packet traces (Page 1, right column section III)].

It would have been obvious to a person of ordinary skill in the art at the time of Applicant's invention to combine the bandwidth calculations and modeling of Chang with the statistical model of Cao.

The motivation for doing so would have been to use the simple time series models in the testing of internet traffic [Cao: More broadly, the results show that engineering studies that are meant to apply to the Internet as a whole, and that use synthetic or live packet traffic to assess performance, need to consider packet traces varying across a wide range of magnitudes of statistical multiplexing in order to achieve generality (Page 2, right column, last paragraph)]

Regarding claim 5 Chang in view of Cao teaches the method of claim 4 wherein the statistical model is a Fractional Sum Difference model [Cao: We found that very simple statistical time series models, which we call fractional sum difference (FSD) models and FSDMA(1) models, provide an excellent fit to the ... for the live and synthetic link packet traces (Page 1, right column section III)].

### ***Allowable Subject Matter***

8. Claims 7-12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for indicating allowable subject matter.

While Cao teaches determining the bandwidth necessary to satisfy a QoS term, and Cao teaches the use of a FAD model neither/none of these reference(s) taken either alone or in combination with the prior art of record disclose where the model takes the form as claimed in claims 7 and 11 specifically including:

(claim 7) The specific model as claimed in claims 7

(claim 11) The specific model as claimed in claims 11,

in combination with the remaining elements and features of the claimed invention. It is for these reason that the applicant's invention defines over the prior art of record.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

As allowable subject matter has been indicated, applicant's reply must either comply with all formal requirements or specifically traverse each requirement not complied with. See 37 CFR 1.111(b) and MPEP § 707.07(a).

### ***Conclusion***

Art Unit: 2123

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LUKE OSBORNE whose telephone number is (571)272-  
Your Allowable subject matter section still indicates 13 and 17 as containing allowable subject matter. I would remove 13-18 from that section.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Luke Osborne/  
Examiner, Art Unit 2123

/Paul L Rodriguez/  
Supervisory Patent Examiner,  
Art Unit 2123